NAME: DATE:

Unit-2 Mastery Assessment (version 637)

Question 1 (10 points)

Let f represent a function. If $f[13] = 50$, then there exists a knowable solution to the equation below.

$$y = 4 \cdot \left(f\left[\frac{x}{2} - 5 \right] - 45 \right)$$

Find the solution.

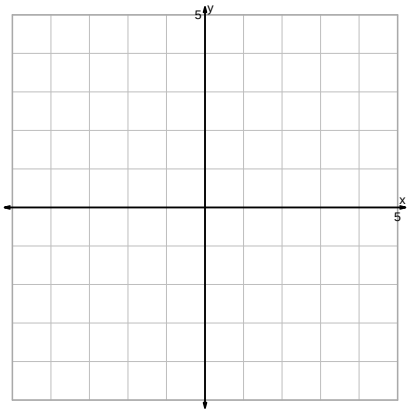
$x =$

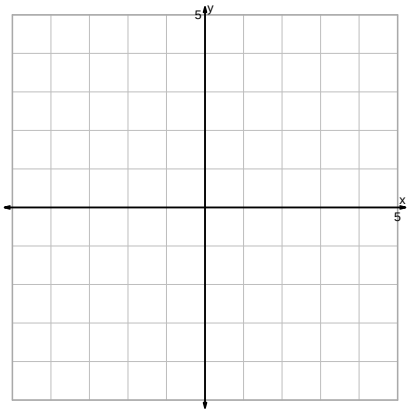
$y =$

Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

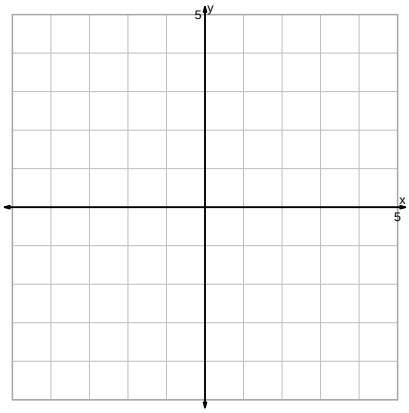
$y = x^2 - 2$

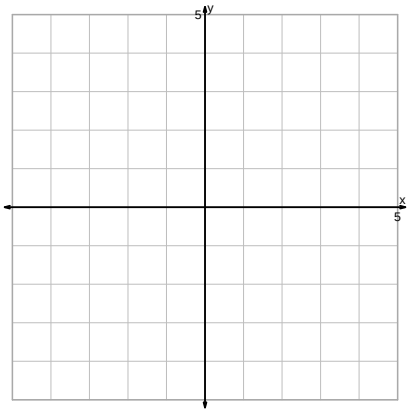




$y = 2 \cdot \sqrt[3]{x}$

$y = \log_2(-x)$

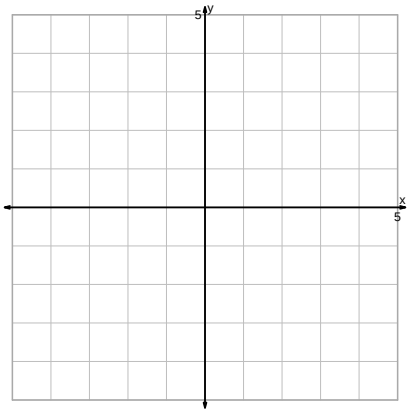


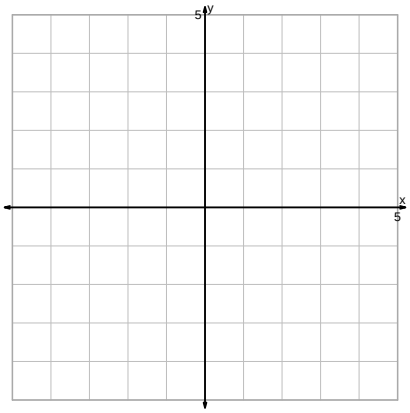


$y = (x+2)^3$

Question 2 continued...

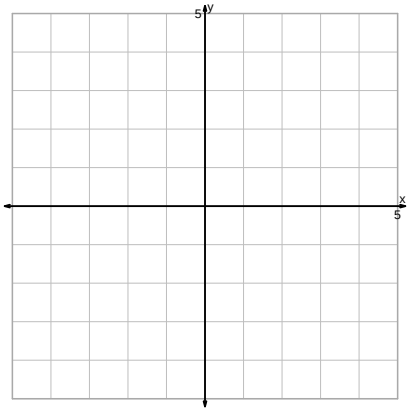
$y = (2x)^2$

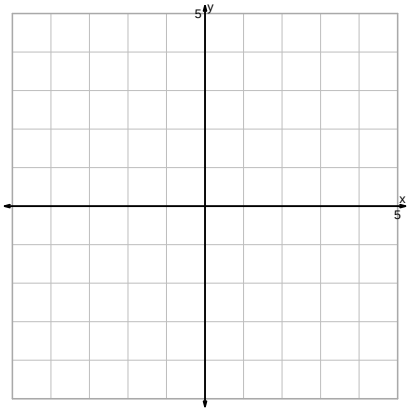




$y = \sqrt{x} + 2$

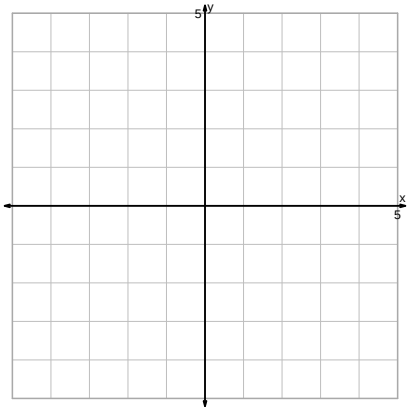
$y = \dfrac{2^x}{2}$

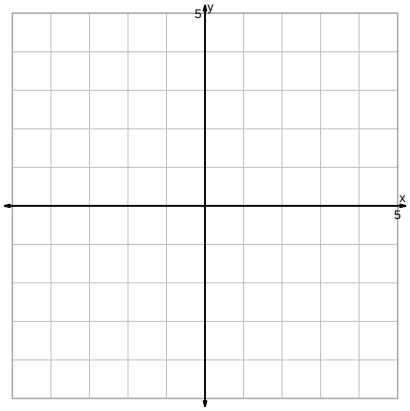




$y = \left(\dfrac{x}{2}\right)^3$

$y = \log_2(x - 2)$

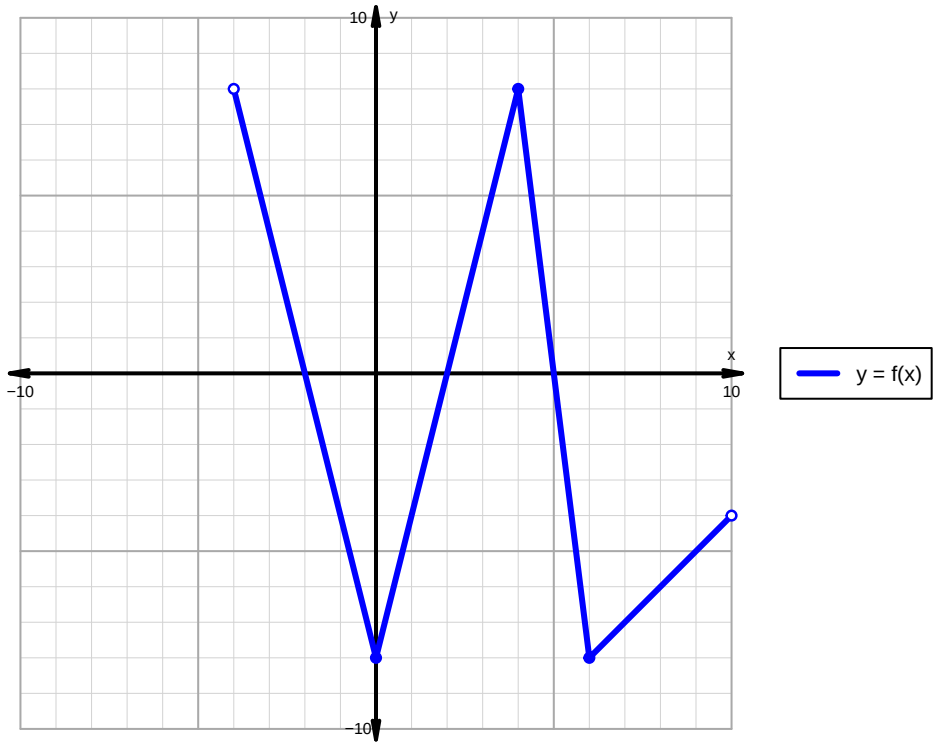




$y = -2^x$

Question 3 (20 points)

A function is graphed below.



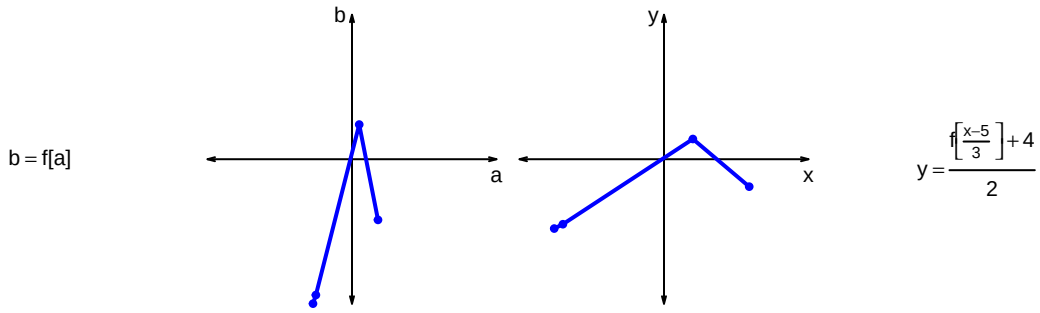
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = \frac{f\left[\frac{x-5}{3}\right]+4}{2}$ are represented below in a table and on graphs.

a	b	x	y
-27	-100	-76	-48
-25	-94	-70	-45
5	24	20	14
18	-42	59	-19



a. Write formulas for calculating x from a and calculating y from b. (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = \frac{f\left[\frac{x-5}{3}\right]+4}{2}$?

Question 5 (10 points)

A parent square-root function is transformed in the following ways:

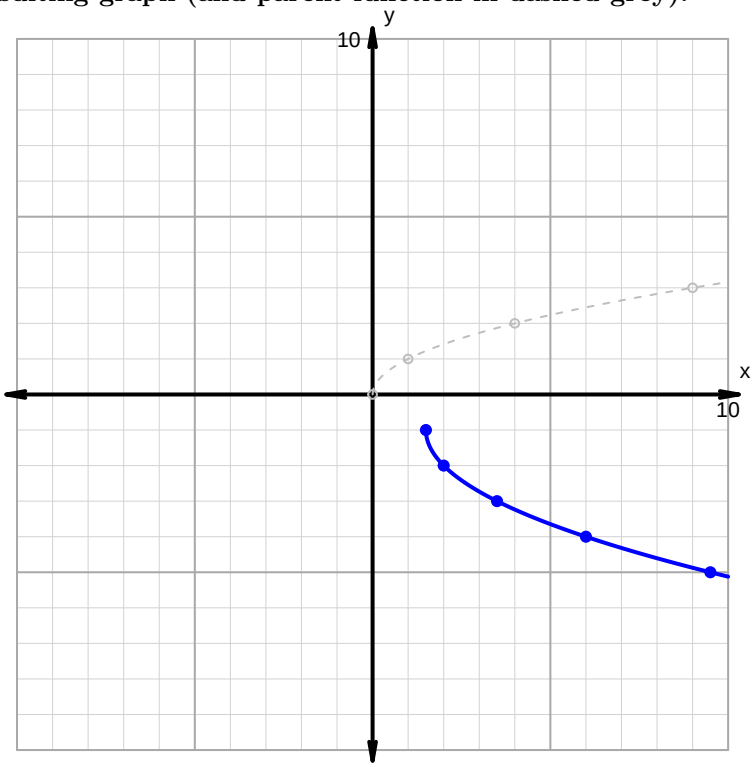
Horizontal transformations

1. Translate right by distance 3.
2. Horizontal shrink by factor 2.

Vertical transformations

1. Vertical reflection over x axis.
2. Translate down by distance 1.

Resulting graph (and parent function in dashed grey):

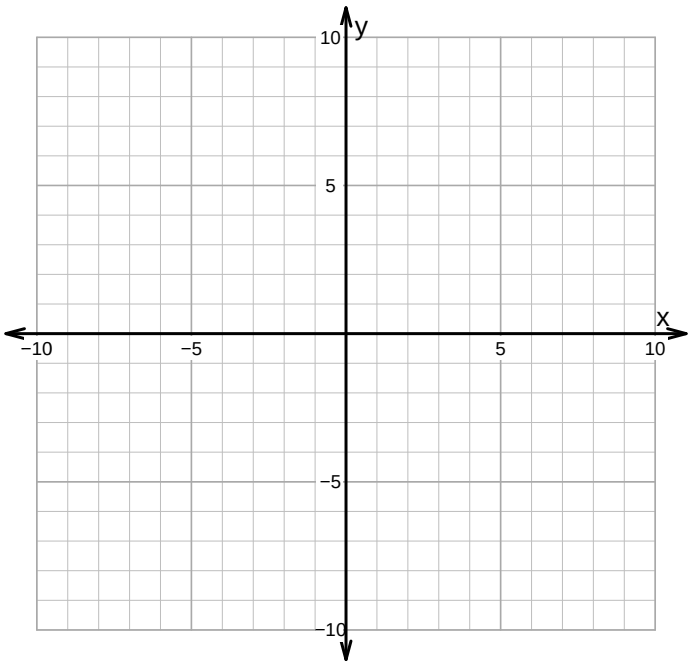


- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y \;=\; -3 \cdot |x - 8| + 3$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	